

What is claimed is:

1. A device comprising:
  - a sub-mount;
  - a die including a sensor that is electrically connected to the sub-mount;
  - a cap attached to the sub-mount so as to form a cavity enclosing the die; and
  - an alignment post attached to the cap along an optical path to the sensor.
2. The device of claim 1, further comprising a sleeve having a bore sized to accommodate the alignment post at a first end of the bore and an optical fiber connector at a second end of the bore.
3. The device of claim 1, wherein the die is attached to the sub-mount so that a front face of the die is adjacent the sub-mount.
4. The device of claim 3, further comprising a lens formed on a back face of the die, the lens focusing a photosensitive area of the sensor.
5. The device of claim 1, further comprising a lens integrated into the cap between the alignment post and the photosensor.
6. The device of claim 1, wherein the sub-mount incorporates an active circuit that operates on an electrical output signal of the sensor.
7. The device of claim 6, wherein the active circuit comprises an amplifier.
8. The device of claim 1, wherein the cavity enclosing the die is hermetically sealed.
9. The device of claim 1, wherein the sub-mount comprises:
  - internal terminals that are within the cavity and electrically connected to the die; and
  - external terminals that are accessible outside the cavity and are electrically connected to the internal terminals.

10. The device of claim 9, further comprising a flexible circuit connected to the external terminals.

11. A device comprising:

a sub-mount;

a die including a sensor having a photosensitive area at a front face of the die, the die being attached to the sub-mount so that the front face of the die is adjacent the sub-mount;

a cap attached to the sub-mount so as to form a cavity enclosing the die, the cap permitting transmission of an optical signal into the cavity; and

a lens on a back face of the die, the lens focusing the optical signal onto the photosensitive area of the sensor.

12. The device of claim 11, further comprising a post attached to the cap along an optical path to the photosensitive area of the sensor.

13. The device of claim 12, further comprising a sleeve having a bore sized to accommodate the alignment post at a first end of the bore and an optical fiber connector at a second end of the bore.

14. The device of claim 11, wherein the sub-mount incorporates an active circuit that operates on an electrical output signal of the sensor.

15. The device of claim 14, wherein the active circuit comprises an amplifier.

16. The device of claim 11, wherein the cavity enclosing the die is hermetically sealed.

17. The device of claim 11, wherein the sub-mount comprises:  
internal terminals that are within the cavity and electrically connected to the die; and  
external terminals that are accessible outside the cavity and are electrically connected to the internal terminals.

18. The device of claim 17, further comprising a flexible circuit connected to the

external terminals.

19. A device comprising:

a semiconductor sub-mount including an active circuit integrated into the semiconductor sub-mount;

a die including a photosensor that is electrically connected to the active circuit; and  
a cap attached to the sub-mount so as to form a cavity enclosing the die.

20. The device of claim 19, wherein the active circuit operates on an electrical output signal of the photosensor.

21. The device of claim 19, wherein the active circuit comprises an amplifier.

22. The device of claim 19, wherein the cavity enclosing the die is hermetically sealed.

23. The device of claim 19, wherein an optical signal enters the cavity through the cap.

24. The device of claim 19, wherein the sub-mount comprises:

internal terminals that are within the cavity and electrically connected to the die; and  
external terminals that are accessible outside the cavity and electrically connected to the internal terminals.

25. The device of claim 24, further comprising a flexible circuit connected to the external terminals.

26. A method for fabricating a package containing a photosensor, comprising:

fabricating a first wafer that includes a plurality of sub-mount areas;

attaching and electrically connecting a plurality of dice respectively to the sub-mount areas, wherein each of the dice contains a photosensor;

bonding caps to the first wafer, wherein the dice are enclosed in respective cavities between the first wafer and the respective caps, and for each of the dice, the photosensor on

the die is positioned to receive an optical signal; and  
dividing the resulting structure to separate a plurality of packages containing the dice.

27. The method of claim 26, wherein fabricating the first wafer comprises forming an active circuit in each of the sub-mount areas.

28. The method of claim 27, wherein the active circuit is an amplifier for an output signal of the photosensor connected to the sub-mount area.

29. The method of claim 26, further comprising:  
processing a substrate to form the photosensor including a photosensitive area at a front face of the substrate; and  
forming a lens on a back face of the substrate to focus light onto the photosensitive area.

30. The method of claim 26, further comprising attaching posts to the packages, wherein each post is along a path of an optical signal to the die in the package.

31. The method of claim 26, wherein the caps comprise respective areas of a second wafer, and bonding the caps to the first wafer comprises bonding the second wafer to the first wafer.

32. The method of claim 26, further comprising affixing a post to one of the packages, wherein the post is along an optical path of the optical signal into the cavity.

33. A method for fabricating a device comprising:  
processing a substrate to form a sensor having a photosensitive area at a front face of the substrate; and  
forming on a back face of the substrate a lens that focuses an optical signal onto the photosensitive area.

34. The method of claim 33, wherein the lens is a diffractive optical element.